Amendment to the Claims

1. (Cancelled)

2. (Currently Amended) A synchronization (sync) signal detector comprising:

a) a sync signal generator for generating a reference sync signal;

b) a sampler connected to the sync signal generator;

c) a waveform correlator connected to the sampler, the waveform correlator receiving a input signal;

d) a peak detector connected to the waveform correlator and the sampler; and

e) a synchronization information calculator connected to the waveform correlator and the peak detector, the synchronization information calculator providing data to one or more components external to the synchronization signal detector, the data provided by the synchronization information calculator including information indicating whether or not the input signal includes a valid sync signal.

3. Cancelled.

4. (Currently Amended) The sync signal detector of claim 2 ~~claim 3~~, implemented in a communication signal receiver.

5. Cancelled

6. (Currently Amended) The sync signal detector of claim 2 ~~claim 5~~, wherein the data provided by the synchronization information calculator ~~the synchronization information comprises~~ further includes a modulation index.

7. (Currently Amended) The sync signal detector of claim 2 ~~claim 5~~, wherein the data provided by the synchronization information calculator ~~the synchronization information comprises~~ further includes a frequency offset.

8. (Previously Presented) The sync signal detector of claim 2, wherein the waveform correlator and the peak detector are implemented in a digital signal processor (DSP).

9. (Previously Presented) The sync signal detector of claim 2, implemented in a communication device selected from the group consisting of wired and wireless modems, hand-held communication devices, personal digital assistants (PDAs) with communication functions, cellular telephones, one-way pagers and two-way pagers.

10 - 20 (Cancelled.)

21. (Currently Amended) A method for detecting a data pattern in an input signal, said method comprising the steps of:

a) matching the data pattern to a known sync pattern using waveform correlation;

b) shifting the known sync pattern by a timing offset determined from the waveform correlation to create a shifted sync pattern; and

c) utilizing the shifted sync pattern to further process the input signal; and

d) generating synchronization information;

wherein the synchronization information comprises a modulation index;

wherein the step of generating synchronization information comprises the steps of:

calculating a modulation index (g) of the input signal using the shifted sync signal, as

$$g = \frac{\sum_i r_i * t_i - \frac{1}{N}\sum_i r_i \sum_i t_i}{\sum_i t_i^2 - \frac{1}{N}\left(\sum_i t_i^2\right)}$$; and

calculating a frequency offset (dc) of the input signal using the shifted sync signal, as

$$dc = \frac{1}{N}\left(\sum_i r_i - g\sum_i t_i\right),$$

where r_i denotes digital samples of the data pattern, t_i denotes digital samples of the shifted sync signal, and i = 1,2,...N are indexes of the samples of the input signal and the shifted sync signal.

22. Cancelled.

23. (Currently Amended) The method of claim 21 ~~claim 22~~, further comprising the steps of:

calculating an amount of noise (E) present in the received signal, using the shifted sync signal, as $E = \sum_i (r_i - gt_i - dc)^2$;

comparing the calculated noise E to a threshold T to determine whether or not the received signal samples r_i represent a valid sync signal; and

performing step c) only if it is determined that the received signal samples represent a valid sync signal.

24. (Previously Presented) The method of claim 21, wherein step b) comprises shifting sampling points within said known sync pattern by the timing offset determined from the waveform correlation to create the shifted sync pattern.

25 - 28. (Cancelled)

29. (Previously Presented) The method of claim 21 wherein the synchronization information comprises a frequency offset.